Stuttgarter Beiträge zur Naturkunde
Serie A (Biologie)

Herausgeber:

Staatliches Museum für Naturkunde, Rosenstein 1, D-70191 Stuttgart

Stuttgarter Beitr. Naturk.	Ser. A	Nr. 642	11 S.	Stuttgart, 1. 11. 2002

The Tachinidae and Oestridae (Diptera) of Madeira, with Description of a New Species

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With 2 figures and 1 table

Summary

Checklists are given for the Tachinidae and Oestridae of the Madeira archipelago. They are based on three different insect collections at Madeira, a field study and a review of the literature. The species *Siphona maderensis* **sp. n.** is described here. Four species are recorded for the first time for Madeira: *Chaetogena acuminata* Rondani, *Drino imberbis* (Wiedemann), *Leucostoma crassum* Kugler und *L. engeddense* Kugler.

Zusammenfassung

In dieser Arbeit werden Checklisten für die Tachinidae und Oestridae Madeiras vorgestellt. Die Materialangaben stammen aus drei Sammlungen auf Madeira, aus neu gesammelten Fliegen und aus Angaben in der Literatur. Eine neue Art, *Siphona maderensis* **sp. n.**, wird beschrieben. 4 Arten werden zum ersten Mal für Madeira nachgewiesen: *Chaetogena acuminata* Rondani, *Drino imberbis* (Wiedemann), *Leucostoma crassum* Kugler, and *L. engeddense* Kugler.

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1. Introduction

In 1998 the first author spent nearly five months on Madeira. During this period he had the opportunity to study the insect collections present at Madeira and to do

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a lot of fieldwork. He collected over 300 specimens of Tachinidae, representing 13 species, including four species new to its fauna and one species new to science. In one of the collections a specimen of Oestridae was discovered, a family previously unrecorded for Madeira. The second author reviewed the material mentioned. Based on these investigations, an annotated checklist is given for the Tachinidae and Oestridae of Madeira.

2. Geography of Madeira

The Madeira archipelago is situated in the eastern Atlantic Ocean, about 630 km off the west coast of Morocco, between 33° 10´ – 32° 20´ N and 16° 10´ – 17° 20´ W. The archipelago consists of the islands Madeira, Porto Santo and the three Desertas islands. All the islands are of Tertiary volcanic origin with an estimated age of between 60 and 70 million years (Stock, 1995). Unlike the Azores and the Canary Islands there has been no recent volcanic activity.

Madeira is the main island of the archipelago being the largest, with an area of 728 km². The landscape is generally rugged with the highest peak reaching up to 1862 m. The area is very steep, with numerous rock ledges and gorges. Porto Santo is the second largest island of the archipelago, situated about 57 km north-east of Madeira. It has an area of approximately 50 km². This island is considerably drier and lower than Madeira. The Ilhas Desertas, three small rocky islands, are situated 24 km south-east of Madeira.

3. Materials and methods

All the data from the following collections are included in this checklist, introducing the abbreviations used in this article: Museu Municipal do Funchal (*MMF*), Laboratorio Agricola da Madeira, at Camacha (*ICLAM*) and the private collection of I. Silva (*IS*). All the specimens from the collection "ICLAM" were collected by A.M. Franquinho Aguiar. Some of the records contain a number in brackets, which refers to the catalogue number of the collection concerned. The collections have been revised by the second author. These data are amplified by observations and collecting done by S. Mostard, J. Smit Sr. and the first author (7 to 21 July 1997), by the first author (2 February to 18 June 1998), B. Roels (30 March to 23 April 1998), and J. Smit Sr. (30 April to 7 May 1998). Porto Santo was visited by B. Roels and the first author from 18 to 20 April 1998. The Ilhas Desertas have not been visited.

The specimens collected are deposited in the collection of the first author (*JTS*) or the second author (*TZ*), unless stated otherwise. If no collector is given, the specimens are found by the first author. Altogether a total of 343 specimens of Tachinidae and one specimen of Oestridae have been examined.

4. Earlier works on the Tachinidae of Madeira

Becker (1908) was the first to report Tachinidae from Madeira. Tiensuu (1939) recorded four species as new for Madeira, including one new to science: *Pales exsulans* Tiensuu. In his checklist of the Diptera from Madeira, Frey (1949) recorded eleven species of Tachinidae, two of them are considered doubtful here. In the present paper another four species are added to this list, making a total of 13 species of tachinids known from Madeira. One of the previously misidentified species is described here as new.

Two authors (VILLENEUVE, 1939 and RINGDAHL, 1960) have reported Rhinophoridae from Madeira. This group has been considered a subfamily of the Tachinidae but is now generally accepted as a separate family (CROSSKEY, 1977). We have not seen any Rhinophoridae from Madeira.

5. Annotated checklist of the Tachinidae of the Madeira archipelago with description of a new species

In the following checklist for each species is given: *Previous records* in the literature from Madeira, the *material seen*, and the *general distribution* of the species. The taxonomy and distribution are based on HERTING (1984) and BÁEZ et alii (1986). In a few cases, relevant distributional information based on the collection of the second author has been added.

5.1. *Chaetogena acuminata* Rondani, 1859

Material: Only 1 ♂ is known. João Frino, 800 m, 19.VII.1997 (var. *approximata*).

Notes: First record for Madeira. For the Canary Isles it has previously been recorded as *Chaetogena acuminata* var. *approximata* Villeneuve. BÁEZ et alii (1986) state: "The var. *approximata* is an individual variation without taxonomic status." It is however noteworthy because this variation is the only form known from the Islands.

Distribution: Western Europe, Mediterranean, Central Asia, Japan, the Canary Islands and Madeira.

5.2. *Compsilura concinnata* (Meigen, 1824)

Compsilura concinnata (Meigen): FREY (1949);
Machaira serriventris Rondani: BECKER (1908) (syn.).

Material: A total of 97 specimens, 46 ♂♂, 45 ♀♀ and 6 with gender unknown have been examined. – Caniçal, 11.II.1989, 1♀ (ICLAM); (0364) 30.XI.1992, 1♂, 2♀♀ reared from a Noctuid (Lepidoptera: Noctuidae) (ICLAM); – Caniço, Barreiros, (939) 27.X.1995, 1♀ (ICLAM); – Chão de Ribeira, Seixal, 400 m, 21.III.1998, 1♀; – Corujeira, Ribeira de Santa Luzia, 600 m, 24.V.1998, 1♂, 6♀♀; – Curral de Baixo, 400-1000 m, 5.IV.1998, 1♂; – Encumeada, 1000 m, (940) 1.IX.1996, 1♀ (ICLAM); – Fajã da Nogueira, 600 m, 8.XII.1995, 1 specimen (IS); 11.IX.1996, 2 specimens, 450 m (IS); 10.III.1998, 5♂♂, 3♀♀, 700 m (1♂ coll. TZ); – Funchal, 1.II.1988, 1♂ (ICLAM); 15.XI.1988, 1♂ (ICLAM); 22.IX.1995, 1♂ (ICLAM); – Funchal, Boaventura, 640 m, 18.VI.1992, 1 specimen (IS); – Funchal, Levada do Amparo, 150 m, 2.IV.1995, 1 specimen (IS); – Funchal, Monte, 550 m, 4.III.1998, 1♀; – Funchal, Picos dos Barcelos, 350 m, 1♂; 7.II.1998, 3♂♂, 2♀♀; 8.II.1998, 2♂♂, 3♀♀ (1♀ coll. TZ); 22.II.1998, 15.II.1998, 3♂♂, 3♀♀; 21.II.1998, 3♂♂, 1♀, (1♂ coll. TZ); 1.III.1998, 9♂♂; 1.IV.1998, 1♂, 1♀; 25.IV.1998, 1♂; – Funchal, São Martinho, (0385) 21.VI.1996, 1♀ (ICLAM); – Lombada dos Marinheiros, 650 m, 15.VII.1997, 1♀; – Loreto, 300 m, 1.V.1998, 1♂; 5.V.1998, 1♀; – Machico, Ribeira de Machico, 19.VII.1997, 1♀; – Peña, 60 m, 16.III.1990, 1 specimen (IS); 8.III.1998, 1♀ (IS); – Ponta de São Lorenço, <100 m, 11.V.1997, 1♂ (ICLAM); 27.II.1998, 1♂; – Santana, 7.X.1997, 1♀ (ICLAM); – São Jorge, 200 m, 4.V.1998, 1♀; – Soccoridos Valley, 250 m, 11.II.1998, 3♂♂, 5♀♀; 16.II.1998, 2♂♂, 1♀ (1♂ coll. TZ); 24.II.1998, 1♂, 5♀♀; 3.IV.1998, 3♂♂, 1♀.

Distribution: Europe, Asia, Africa and Madeira.

5.3. *Nemorilla maculosa* (Meigen, 1824)

Nemorilla floralis Fallén: Tiensuu (1939), Frey (1949) (misidentified);
Nemorilla notabilis Meigen: Becker (1908) (misidentified).

Material: A total of 34 specimens, 22 ♂♂, 11 ♀♀ and 1 with gender unknown have been examined. – Câmara de Lobos, Preces, (0227) 5.IX.1995, 1♂ (ICLAM) reared from *Helcystogramma convolvuli* (Lepidoptera: Gelichiidae); 3.V.1998, 1♀; – Chão de Ribeira, Seixal, 400 m, 15.IV.1998, 1♀ (coll. TZ); – Fajã da Nogueira, 900 m, 22.III.1995, 1 specimen (IS); 10.III.1998, 1♂, 700 m; – Fontes, 1100 m, 16.VII.1997, 2♀♀; – Funchal, Santa Quiteria, 250 m, 10.VII.1997, 1♂; 31.V.1998, 1♂, 200 m; – João Frino, 700 m, 19.VII.1997, 1♂ (coll. TZ); – L.J. Boieiro, São Roque, (1278) 8.III.1953, 1♀, leg. A. Figueira (MMF); – Loreto, 300 m, 5.V.1998, 1♀ (coll. TZ); – Palheiro Ferreiro, 550 m, 19.VII.1997, 1♂; 6.V.1998, 1♂; – Ponta de São Lorenço, <100 m, 2.V.1998, 1♂ (coll. TZ); – Portella, 600 m, 19.VII.1997, 10♂♂, 2♀♀ (1♂ coll. TZ); – Rabaçal, 1000 m, 20.VII.1997, 1♀ (coll. TZ); 3.III.1998, 3♂♂, 1050 m (2♂♂ coll. TZ); – Ribeira Brava, Boa Morte, 600 m, 3.V.1998, 1♀; – Ribeiro Frio, 900 m, 17.VII.1997, 1♀; – Soccoridos Valley, 250 m, 7.VI.1998, 1♂.

Note: All specimens from Madeira are unusually dark on abdomen and wings. We cannot find any differentiating characters, not even in the genitalia. Therefore we consider them to be a local dark form of *N. maculosa*.

Distribution: Europe, Asia, North America, the Canary Islands and Madeira.

5.4. *Aplomyia confinis* (Fallén, 1820)

Exorista confinis Fallén: Tiensuu (1939), Frey (1949).

Material: A total of 15 specimens, 8 ♂♂ and 7 with gender unknown have been examined. – Chão de Lagoa, 1475 m, 26.IV.1992, 2 specimens (IS); 20.VII.1992, 2 specimens (IS); 13.VII.1992, 1 specimen (IS); – Fajã da Nogueira, 700 m, 10.III.1998, 2♂♂; – Fontes, 1100 m, 16.VII.1997, 2♂♂; – Funchal, Barreira, 900 m, 19.II.1998, 3♂♂; – Poco de Neve, 1600 m, 24.VII.1993, 2 specimens (IS); – Portella, 600 m, 19.VII.1997, 1♂.

Distribution: Europe, Asia, North America, the Canary Islands and Madeira.

5.5. *Drino imberbis* (Wiedemann, 1830)

Material: Only 2 specimens, 1 ♂ and 1 ♀ are known. – Machico, Mouth of Ribeira de Machico, 19.VII.1997 1♂, 1♀.

Notes: First record for Madeira. The collected male is blackish grey instead of yellowish grey.

Distribution: Northern and tropical Africa, Near and Middle East, the Canary islands and Madeira.

5.6. *Pales exsulans* Tiensuu, 1939

Pales exsulans Tiensuu: Tiensuu (1939), Frey (1949);
Phorocera cilipeda Rondani: Becker (1908) [syn. *Pales pavida* (Meigen)] (misidentified).

Material: A total of 11 specimens, 5 ♂♂ and 6 ♀♀ have been examined. – Funchal, Barreira, 900 m, 19.II.1998, 1♀; – Funchal, Monte, 400 m, 11.VI.1998, 1♀; – Montado do Barreiro, 1000 m, 15.V.1998, 1♂, 1♀ (♂ coll. TZ); 20.V.1998, 1♂, 1♀; – Poco de Neve, 1650 m, 11.VII.1997, 1♂, 1♀ (♀ coll. TZ); – Rabaçal, 1150 m, 20.VII.1997, 1♂; – Ribeira Brava, Boa Morte, 600 m, 3.III.1998, 1♂ (coll. Staatliches Museum für Naturkunde, Stuttgart).

Distribution: Endemic to Madeira.

5.7. *Gonia bimaculata* (Wiedemann, 1819)

Gonia bimaculata (Wiedemann): TIENSUU (1939), FREY (1949);
Gonia cilipeda Rondani: BECKER (1908) (syn.);
?*Gonia capitata* De Geer: BECKER (1908), FREY (1949) (probably misidentified);
?*Gonia nana* Becker: BECKER (1908), FREY (1949) (probable synonym).

Material: A total of 53 specimens, 31 ♂♂ and 22 ♀♀ have been examined. – Chão de Lagoa, 1475 m, 20.VII.1992, 1♀ (IS); 22.VIII.1995, 1♂, 1♀, 1450 m (IS); – Chão de Ribeira, 400 m, 15.X.1996, 1♂, (IS); – Fontes, 1200 m, 16.VII.1997, 1♀; – Funchal, 260 m, 15.I.1992, 1♂ (IS); 3.III.1996, 1♀, 150 m (IS); – Funchal, Lido Sol, 40 m, 12.X.1997, 4♀♀ (IS); – Funchal, São Martinho, 160 m, 7.II.1993, 1♀ (IS); – Funchal, Picos dos Barcelos, 350 m, 7.VII.1997, 3♂♂; 13.VII.1997, 2♂♂; 15.VII.1997, 1♂; 15.II.1998, 1♂; 5.IV.1998, 2♂♂ (1♂ coll. TZ); 10.VI.1998, 5♂♂; – João Frino, 800 m, 19.VII.1997, 8♂♂, 1♀; – L.J. Boieiro, São Roque, (2311) 25.VII.1953, 1♀, leg. A. FIQUEIRA (MMF); – Palheiro Ferreiro, 550 m, 19.VII.1997, 1♀; – Paúl da Serra, 1300 m, 23.IX.1989, 4♂♂ (ICLAM); – Poco de Neve, 1600 m, 18.VII.1992, 1♀ (IS); 11.VII.1997, 1♀; – Ponta de São Lorenço, <100 m, 22.II.1998, 1♀; 25.III.1998, 2♀♀; 17.IV.1998, 1♀; 2.V.1998, 1♀; 3.V.1998, 3♀♀ (1♀ coll. TZ); – Santo da Serra, (2344) VIII.1953, 1♂, leg. G. MAUL (MMF); 11.XII.1988, 1♂ (ICLAM).

Notes: *Gonia bimaculata* is a common species on Madeira and all *Gonia* from Madeira seen by us clearly belong to this species. BECKER's record of *Gonia capitata* probably refers to *G. bimaculata* (see also BÁEZ et alii, 1986). His new species *G. nana* might very well be a dwarf-specimen of *G. bimaculata*. A similar situation is found in the subspecies *cabrerae* Mesnil from Hierro (MESNIL, 1956). This specimen is considered a slightly aberrant individual of *G. bimaculata* (BÁEZ et alii, 1986). We have not seen the material of BECKER. Therefore, we provisionally place BECKER's records under *G. bimaculata* as a probable synonym.

Distribution: Southern Europe, North Africa, Azores, Canary Islands and Madeira.

5.8. *Siphona maderensis* **sp. n.**

Bucentes cristatus (Fabricius): BECKER (misidentified);
Siphona cristata (Fabricius): TIENSUU (1939), FREY (1949) (misidentified).

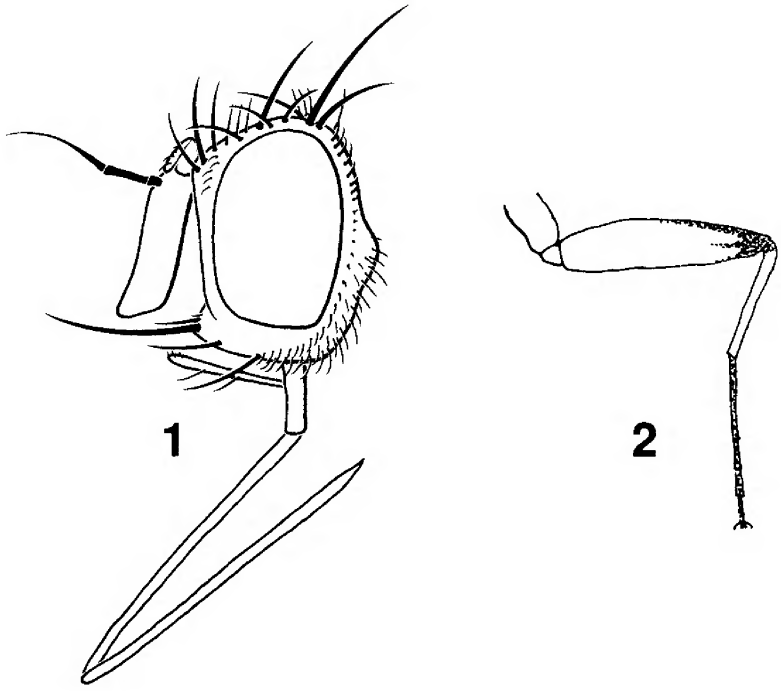
The species *Siphona cristata* (Fabricius) has been recorded from Madeira by several authors. The occurrence of this species at Madeira is doubtful, these recordings will probably be misidentifications of *maderensis* sp. n. All specimens of this genus collected by the first author represent this new species.

Material: A total of 11 specimens, 8 ♂♂ and 3 ♀♀ have been examined.

Holotype: ♂ **Madeira**: Montado do Barreiro 1000 m, 15.V.1998, leg. J.T. SMIT, coll. Zoological Museum, Amsterdam.

Paratypes: **Madeira**: Chão de Ribeira, Seixal, 400 m, 15.IV.1998, 1♂ (coll. TZ); same locality, 23.V.1998, 1♀; – Montado do Barreiro 1000 m, 15.V.1998, 5♂♂ (1♂ coll. Zoological Museum, Amsterdam; 1♂ coll. Systematic Entomology Section, Agriculture & Agri-Food, Canada; 1♂ coll. Staatliches Museum für Naturkunde, Stuttgart; 1♂ coll. TZ); – Soccorides Valley, 250 m, 16.II.1998, 1♂, 2♀♀ (1 ♂ coll. Systematic Entomology Section, Agriculture & Agri-Food, Canada; 2♀♀ coll. TZ); same locality, 3.IV.1998, 1 ♀.

Diagnosis: Prementum long, distinctly longer than the height of the head. Thorax with 4 postsutural dorsocentral bristles, epaulette black. All femora extensively darkened at the apices (knees included), femur 1 with 3 or more pv-bristles, femur 2 with a small anterior bristle just below the top. Abdomen rather dark, males often with small yellow side-markings. Syntergite 1+2 dorsal without marginal bristles but with strong lateromarginal bristles. Tergite 5 small, its length only about 60 % of tergite 4.



Figs 1-2. *Siphona maderensis* sp. n. – 1. Head, lateral view; – 2. hind leg, frontal view.

Description of male: Head (Fig. 1) in profile rather high, face and antenna about 1.4-1.5 times as long as the frons, frons of similar colour as the face. Gena rather small, about 0.15 times as high as the eye. Parafacial about as broad as the palp or a little broader, tapering downwards. Only a few smaller hairs present on the parafacial below the frontal bristles. Frontal stripe broad, about three times as broad as the parafrontal. Several larger hairs present on the vertex between the ocellar and the postocellar bristles, these hairs at least half as long as the postocellar bristles. Palpi yellow, about as long as third antennal segment, clearly clavate towards tip, with a few longer hairs outside and several very tiny hairs on the inner side. Proboscis long, prementum clearly longer than the height of the head (1.2-1.3 times) (Fig. 1). Antenna and arista black, third antennal segment almost rectangular, only slightly broadened towards top, 3.5-4.0 times as long as broad and 3.5-4.0 times as long as the second segment. Second segment of arista long, about 1/4 to 1/3 of the total aristal length.

Thorax slightly vittate, 4 strong postsutural dorsocentral bristles present, presutural intra-alar bristle well developed, prosternum with one pair of bristles, two setulae present behind the lower sternopleural bristle.

Legs yellow, all femora strongly darkened at tip, this black area being as long as broad in both anterior and posterior view, it extends along the upper side of the femora towards the base (Fig. 2). The dark area is quite sharply separated from the yellow groundcolour, tarsi black, claws short (as usual in *Siphona*). Femur 1 with a row of 4-6 strong pd-bristles, 1 basal and 2 proximal pv-bristles with bristle-like hairs in between. Femur 2 with a small anterior bristle just before the top.

Wings as in other *Siphona*, epaulette black, vein R_1 bare. Halteres orange-yellow.

Abdomen dark, dorsally usually with small lateral yellow patches confined to the tergites 1+2 and 3, sometimes without yellow patches. Tergites laterally covered with a thin silvery coating, which leaves median dark triangles on tergites 3 and 4. Tergite 5 nearly completely silvery dusted, with only a small dark median vitta. Abdomen predominantly yellow ventrally. Tergite 5 unusually small, its length only 1/2 to 2/3 of the length of tergite 4. Syntergite 1+2 without dorsal marginal bristles but with strong lateromarginal bristles. Tergite 3 with 2 dorsal marginal and 2 strong lateromarginal bristles. Tergite 4 with a row of 6 marginal bristles. All these marginal bristles are half-erect and at least as long as the length of the segment they are implanted on. On the anterior part of tergites 3 and 4 a band without setulae, which is very small in the middle but distinctly widening sidewards, on lateral margin of tergite 4 occupying about one-fifth of tergal length.

Description of female: The female differs from the male in a for *Siphona* usual way: Antenna shorter, about as long as frons, third antennal segment 2.5-3.0 times as long as wide. Palpi clavate. Abdomen without yellow side markings.

Length: 4-5 mm.

Remarks: The genus *Siphona* is one of the most difficult genera of Tachinidae to identify. In the most recent review of ANDERSEN (1996) 20 species are recognised in Europe. Non-European western Palaearctic species are *S. seyrigi* Mesnil, 1960 from the Canary Isles and *S. efflatouni* Mesnil, 1960 from Egypt and Palestine (MESNIL, 1964, 1965).

Siphona maderensis sp. n. is easily separated from all continental species of *Siphona* by just a few characters. Many of these are shared with *S. seyrigi*. Therefore we compare this new species mainly with *S. seyrigi*. Mr. J. O'HARA kindly informed us that the specimens from Madeira do not belong to any known Nearctic species (which is always a small possibility on the Atlantic Isles).

Comments: The characters mentioned under 'Diagnosis' distinguish *S. maderensis* sp. n. from all known continental Palaearctic species of *Siphona*. Besides *S. seyrigi* the combination of darkened knees and black epaulette is found in *S. boreata* Mesnil, 1960, *S. pauciseta* Rondani, 1865, *S. confusa* Mesnil, 1961, *S. pilistyla* Andersen, 1996, and *nigricans* (Villeneuve, 1930). We note that the extension of black on the femora is much larger than in any of these species, with the exception of *S. nigricans* and perhaps *S. pilistyla* (which was not available to us). *S. confusa* and *S. pilistyla* differ from *S. maderensis* by the lower number of postsutural dorsocentral bristles (3) and by the much shorter proboscis. *S. boreata* and *S. pauciseta* differ in having only 2 pv-bristles on femur 1. Moreover, in *S. boreata* the male antenna is much broader. In *S. pauciseta* the antenna is much shorter and the epaulette is dark red (not black). Finally, *S. nigricans* is a much darker species with very dark abdomen (more like a species of *Actia*) and with extensively darkened legs. The third antennal segment is typically broadened in the male. – *Siphona maderensis* sp. n. versus *S. seyrigi* Mesnil: All characters mentioned so far are shared by *S. maderensis* and *S. seyrigi*. They also share the very broad frontal stripe and the unusual small tergite 5. Both species seem to be close relatives. The two species are easily separated by MESNIL's character for *S. seyrigi*: the lacking anterior bristle just below the tip of femur 2, is present, though small, in *S. maderensis*. – *S. maderensis* is also much darker than *S. seyrigi*. We note, however, that Diptera have a tendency to be darker at Madeira than in continental populations (SMIT, 1998). – More subtle differences are found in the head profile, where the parafacial is broader in *S. maderensis* than in *S. seyrigi*, and in

the hairs on the vertex between ocellar and postocellar bristles. The conspicuous hairs between these bristles in *S. maderensis* seem to be unique for this species.

Distribution: *Siphona maderensis* sp. n. is endemic to Madeira. Given the fact that only eleven specimens could be collected in nearly 5 months, it seems to be rather rare. At least much rarer than *S. seyrigi* is on the Canary Isles.

Couplet 6 in the key of MESNIL (1964, p. 854) may be replaced as follows:

6 Apex of all femora extensively darkened (Fig. 2). Femur 1 with at least 3 pv-bristles. Tergite 5 exceptionally short, only 1/2-2/3 of tergite 4 (species endemic to Atlantic islands) ... **6a**
– Femora yellow or darkened at knees only. Femur 1 with at most 2 pv-bristles. Tergite 5 generally at least 2/3 of tergite 4 (species usually outside Atlantic islands) **7**

6a Small anterior bristle near top of second femur present. Males: abdomen with yellow side markings confined to tergite 1+2 and 3, sometimes even completely absent. Hairs between ocellar and postocellar bristles conspicuous: more than half as long as postocellars (Madeira) ..... ***S. maderensis* sp. n.**
– Anterior bristle near top of second femur absent. Males: abdomen with large yellow side markings on anterior 3-4 tergites. Hairs between ocellar and postocellar bristles very small (Canary Isles) ..... ***S. seyrigi*** Mesnil.

5.9. *Voria ruralis* (Fallén, 1810)

Plagia ruralis Fallén: BECKER (1908);
Voria ruralis (Fallén): FREY (1949).

Material: A total of 3 specimens, 2 ♂♂ and 1 ♀ have been examined. – Funchal, Barreira, 900 m, 13.VII.1997, 1♀; – Ponta de São Lorenço, <100 m, 25.III.1998, 1♂; – Soccoridos Valley, 250 m, 24.II.1998, 1♂.

Distribution: Europe, Asia, North America and Madeira.

5.10. *Phasia pusilla* Meigen, 1824

Allophora pusilla Meigen: TIENSUU (1939);
Parallophora pusilla Meigen: FREY (1949).

Material: A total of 98 specimens, 56 ♂♂, 38 ♀♀ and 4 with gender unknown have been examined. – **Madeira**: Campanario, 250 m, 23.V.1998, 1♀; – Caniçal, 2.V.1998, 1♂; – Caniço, Reis Magos, 6.VI.1998, 1♂; – Chão de Ribeira, Seixal, 400 m, 23.V.1998, 1♂; – Funchal, Jardim Botanico, 250 m, 9.VII.1997; 1♂; 22.V.1998, 1♂; – Funchal, Picos dos Barcelos, 350 m, 7.VII.1997, 2♀♀; 8.VII.1997, 1♂, 1♀; 8.III.1998, 2♂♂; 4.IV.1998, 7♂♂, 6♀♀; 12.IV.1998, 5♂♂ 13♀♀; 30.IV.1998, 2♂♂, 4♀♀; 30.V.1998, 2♂♂; – Funchal, Pico Santo Antonio, 400 m, 28.II.1998, 1♂; 1.IV.1998, 2♂♂; 2.IV.1998, 1♂; 22.IV.1998, 1♂; – Lombada dos Marinheiros, 650 m, 15.VII.1997, 1♂; – Loreto, 300 m, 5.V.1998, 1♂; – Palheiro Ferreiro, 550 m, 19.VII.1997, 2♂♂; – Pico do Lagiado, 1300 m, 23.VII.1995, 4 specimens (IS); – Ponta do Pargo, 150 m, 5.V.1998, 2♂♂, 3♀♀; 19.V.1998, 1♀; – Ponta de São Lorenço, <100 m, 17.IV.1998, 6♂♂, 4♀♀; – Rabaçal, 1100 m, 9.VIII.1997, 1♂ (ICLAM); – Ribeira Brava, 500 m, 1.V.1998, 1♂; – Ribeira Brava, Cruz, 200 m, 5.V.1998, 1♂. – **Porto Santo**: Vila Baleira, 18.IV.1998, 1♂, 1♀; 19.IV.1998, 11♂♂, 2♀♀.

Note: This is the first record for Porto Santo.
Distribution: Europe, Asia, Azores, Canary Isles and Madeira.

5.11. *Leucostoma crassum* Kugler, 1966

Material: Only 1♂ is known. – Ribeira Brava, Boa Morte, 600 m, 3.III.1998, 1♂.

Note: First record for Madeira.

Distribution: Mediterranean part of Europe (north to Switzerland and SW Germany), near East, the Canary Isles and Madeira.

5.12. *Leucostoma engeddense* Kugler, 1966

Material: A total of 10 specimens, 6 ♂♂ and 4 ♀♀ have been examined. – **Madeira**: Funchal, Picos dos Barcelos, 350 m, 4.IV.1998, 1♂, 3♀♀ (1♂ coll. TZ); 10.VI.1998, 3♂♂, 1♀ (1♀ coll. TZ). – **Porto Santo**: Vila Baleira, 20.IV.1998, 2♂♂.

Note: First record for Madeira and for Porto Santo.

Distribution: Southern Spain, Algerian Sahara, Israel, the Canary Isles and Madeira.

5.13. *Cylindromyia brassicaria* (Fabricius, 1775)

Ocyptera brassicaria Fabricius: Tiensuu (1939), Frey (1949).

Material: A total of 16 specimens, 13 ♂♂ and 3 ♀♀ have been examined. – Chão de Lagoa, 1475 m, 19.VIII.1992, 1♂ (IS); – Fontes, 1200 m, 16.VII.1997, 1♂; – Funchal, Lido Sol, 40 m, 28.V.1996, 1♂ (IS); – Funchal, Pico dos Barcelos, 350 m, 7.VII.1997, 2♂♂; – 13.VII.1997, 1♂; 15.II.1998, 1♂; 10.VI.1998, 4♂♂, 3♀♀; – Lombada dos Marinheiros, 650 m, 15.VII.1997, 1♂; – Ponta do Pargo, 150 m, 19.V.1998, 1♂.

Distribution: Europe, Asia, Canary Islands and Madeira.

6. Annotated checklist of the Oestridae of the Madeira archipelago

No species of this family have previously been recorded for Madeira. Therefore this is a new family for the Madeira archipelago.

6.1. *Oestrus ovis* Linnaeus, 1758

Material: Only 1 ♀ is known. – Chão de Lagoa, 1440 m, 22.VIII.1995, 1♀ (IS).

Notes: First record for Madeira. This species is most likely introduced with its host, sheep.

Distribution: World-wide, including Canary Isles.

7. Zoogeography

Of the thirteen recorded species of Tachinidae two are endemic: *Pales exsulans* and *Siphona maderensis* sp. n. One species has an Afrotropical affinity: *Drino imberbis*. The other ten species have a Palaearctic affinity, of which three species are Holarctic: *Aplomyia confinis*, *Nemorilla maculosa* and *Voria ruralis*. From the seven remaining Palaearctic species three are restricted to the Mediterranean.

The affinities are conform to most terrestrial faunistic groups present at Madeira (Báez, 1993): A very low Afrotropical affinity and a weaker Mediterranean affinity than central European. The percentage of endemic species is low compared to the overall value of about 27% of the terrestrial groups studied so far (Báez, 1993). However the number of species is too low for a proper analysis. Moreover the percentage of endemic species in some groups with good flying ability seems to be lower than stated by Báez (1993), e.g. hoverflies (Diptera; Syrphidae) 12% (Smit, 1998),

wasps (Hymenoptera) 4% (SMIT, 2000) and dragonflies (Odonata) 14% (SMIT in press).

When we compare the faunas of the four different north-eastern Atlantic archipelagos (Tab. 1), it becomes obvious that the Mediterranean and Afrotropical affinity increases southwards.

Table 1. The differences in zoogeographical affinity among the four northeastern Atlantic archipelagos, showing a shift from mainly Palaearctic to a more Mediterranean and Afrotropical species affinity from north to south. The numbers are based on: BÁEZ et alii, 1986 (Canary Isles), FREY, 1945 (Azores) and HERTING, 1958 (Cape Verde).

Affinity	Azores	Madeira	Canary Isles	Cape Verde
Holarctic	–	3	2	–
Palaearctic	5	7	37	3
(Mediterranean)	(2)	(3)	(32)	(2)
Afrotropical	–	1	2	4
Endemic	–	2	8	1
Total number	5	13	52	8

8. Acknowledgements

We would like to thank the following persons: J.M. BISCOITO (Funchal, Madeira), director of the museum, for the use of the facilities of the Muséu Municipal do Funchal and for the provided material; I. SILVA (Funchal, Madeira) for providing the material present in his private collection; A.M.F. AGUIAR (Funchal, Madeira) for providing the material of the collection of the Laboratorio Agricola da Madeira and of his private collection. Dr. J. O'HARA (Systematic Entomology Section, Agriculture & Agri-Food Canada) for comparing the *Siphona* material with Nearctic species and useful comments on an earlier version of this article; Dr. H.-P. TSCHORSNIG (Staatliches Museum für Naturkunde, Stuttgart, Germany) for identifying the *Leucostoma* species.

9. Bibliography

ANDERSEN, S. (1996): The Siphonini (Diptera: Tachinidae) of Europe. – Fauna ent. scand. **33**: 1-148; Leiden.

BÁEZ, M. (1993): Origins and affinities of the fauna of Madeira. – Boll. Mus. munic. Funchal (Suppl.) **2**: 9-40; Funchal.

BÁEZ, M., B. HERTING & H.-P. TSCHORSNIG (1986): The Tachinidae (Diptera) of the Canary Islands. – Stuttgarter Beitr. Naturk. (Ser. A) 394: 15 pp.; Stuttgart.

BECKER, T. (1908): Dipteren der Insel Madeira. – Mitt. zool. Mus. Berl. **4** (1): 183-206; Berlin.

CROSSKEY, R.W. (1977): A review of the Rhinophoridae (Diptera) and a revision of the Afrotropical species. – Bull. Br. Mus. nat. Hist. (Ser. Ent.) **36** (No. 1): 1-66 ; London.

FREY, R. (1945): Tiergeographische Studien über die Dipterenfauna der Azoren. I. Verzeichnis der bisher von den Azoren bekannten Dipteren. – Commentat. biol. **8** (10): 1-114; Helsinki.

– (1949): Die Dipterenfauna der Insel Madeira. – Commentat. biol. **8** (16): 1-47; Helsinki.

HERTING, B. (1958): Tachiniden (Diptera) von den Kapverdischen und Kanarischen Inseln. – Commentat. biol. **18** (7): 3-7; Helsinki.

– (1984): Catalogue of Palearctic Tachinidae (Diptera). – Stuttgarter Beitr. Naturk. (Ser. A) 369: 228 pp.; Stuttgart.

MESNIL, L.P. (1956): Larvaevorinae (Tachininae), pp. 465-560. – *In*: LINDNER, E. (ed.): Die Fliegen der paläarktischen Region **64g**; Stuttgart (Schweizerbart).

– (1964): Larvaevorinae (Tachininae), pp. 849-864, pls 18-25. – *In*: LINDNER, E. (ed.): Die Fliegen der paläarktischen Region **64g**; Stuttgart (Schweizerbart).

– (1965): Larvaevorinae (Tachininae), pp. 865-879, pls 26-27. – *In*: LINDNER, E. (ed.): Die Fliegen der paläarktischen Region **64g**; Stuttgart (Schweizerbart).
RINGDAHL, O. (1960): Muscidae and Tachinidae (Diptera, Cyclorrhapha) from the Azores and Madeira. – Boll. Mus. munic. Funchal **13** (37): 98-100; Funchal.
STOCK, J.H. (1995): Biogeography and evolutionary scenario of aquatic organisms in Macaronesia. – Boll. Mus. munic. Funchal (Suppl.) **4**: 729-745; Funchal.
SMIT, J. (2000): The wasps of Madeira (Hymenoptera: Chrysididae, Pompilidae, Vespidae, Sphecidae). – Entomofauna **21** (13): 165-180; Linz.
SMIT, J.T. (1998): De zoogeografie van de libellen en de zweefvliegen van Madeira (Odonata & Diptera; Syrphidae). – Scriptie Hogeschool van Utrecht (Faculteit Educatieve Opleidingen) 40 pp.; Utrecht.
– (in press): The Odonata of Madeira.
TIENSUU, L. (1939): Die Arthropodenfauna von Madeira nach den Ergebnissen der Reise von Prof. Dr. O. LUNDBLAD Juli-August 1935. XII. Diptera: Muscidae und Tachinidae. – Ark. Zool. **30 A** (No. 22): 1-11; Helsinki.
VILLENEUVE, J. (1939): Présentation de quelques Myodaires supérieurs inedits. – Bull. Annls Soc. r. ent. Belg. **79**: 347-354; Bruxelles.

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ISSN 0341-0145

Schriftleitung: Dr. Wolfgang Seeger, Rosenstein 1, D-70191 Stuttgart
Gesamtherstellung: Gulde-Druck GmbH, D-72072 Tübingen